AMENDMENTS

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of the claims in the application:

Listing of Claims:

1. (previously presented) A system for improving transmission of DSL signals over a local loop, the system comprising:

a loop extender with communications, control, and diagnostic functionality, wherein the loop extender comprises:

amplification circuitry to amplify a digital subscriber line signal on a local loop;

an analog multiplexer / analog-to-digital (AMADC) converter coupled to the amplification circuitry to sample the digital subscriber loop signal within the amplification circuitry; and

a diagnostic/control processor (DCP) coupled to the analog multiplexer / analog-to-digital converter to analyze the sampled digital subscriber loop signal and to evaluate the amplification circuitry.

2. (previously presented) The system of claim 1, further comprising a central office controller coupled to the loop extender via the local loop for controlling the loop extender, wherein the central office controller comprises:

a modem for communication with the loop extender;

a processor coupled to the modem; and

loop extender management software executable by the processor.

3. (previously presented) The system of claim 2, wherein the modem is coupled to the local loop to communicate in a voice-frequency band.

4. (previously presented) The system of claim 2, wherein the processor is coupled to the modem to generate control signals.

5. (previously presented) The system of claim 4, wherein the central office controller is configured to transmit the control signals to the loop extender via the local loop when POTS signals are not present on the local loop.

6. (previously presented) The system of claim 2, further comprising:

an ATU-C coupled to the local loop configured to receive and transmit the DSL signals; and

a DSLAM controller coupled to the processor and the ATU-C configured to control access to the local loop.

7. (previously presented) The system of claim 6, wherein the processor is coupled to the DSLAM controller to receive local loop information from the DSLAM controller.

8. (previously presented) The system of claim 6, wherein the processor is coupled to the DSLAM controller to send instructions to the DSLAM controller for operating the ATU-C.

9. (previously presented) The system of claim 5, wherein the loop extender further comprises:

a POTS loading coil adapted to be coupled to the local loop for improving transmission of POTS band signals over the local loop; and

bypass switches to capacitively couple the amplification circuitry to the local loop.

10. (previously presented) The system of claim 9, further comprising:

a modem coupled to the local loop and the diagnostic/control processor for communication with the central office controller; and

diagnostic lines to couple the analog multiplexer / analog-to-digital converter (AMADC) to the amplification circuitry for sampling DSL signal data.

11. (previously presented) The system of claim 10, wherein the DCP is coupled to the AMADC to process the sampled DSL signal data to compute average power.

12. (previously presented) The system of claim 10, wherein the DCP is coupled to the AMADC to process the sampled DSL signal data to compute peak power.

13. (previously presented) The system of claim 10, wherein the DCP is coupled to the AMADC to process the sampled DSL signal data to compute root-mean-square power.

14. (previously presented) The system of claim 10, wherein the DCP is coupled to the AMADC to process the sampled DSL signal data to compute power spectral density.

15. (Original) The system of claim 10, further comprising a bypass relay for coupling the DCP to the bypass switches.

16. (previously presented) The system of claim 15, wherein the DCP, in response to control signals from the central office controller, is configured activate the bypass relay to uncouple the amplification circuitry from the local loop.

17. (previously presented) The system of claim 15, wherein the DCP, in response to control signals from the central office controller, is configured deactivate the bypass relay to couple the amplification circuitry to the local loop.

18. (currently amended) A method for improving transmission of DSL signals over a local loop, comprising:

configuring a loop extender with communications, control, and diagnostic functionality; ~~and~~

sampling a digital subscriber loop signal within amplification circuitry of the loop extender to evaluate the amplification circuitry; and

using the sampled DSL signals to improve transmission of the DSL signals over the local loop.

19. (previously presented) The method of claim 18, further comprising:

controlling the loop extender with a central office controller coupled to the loop extender via the local loop;

generating control signals via a processor; and

transmitting the control signals to the loop extender via the local loop when POTS signals are not present on the local loop.

20. (previously presented) The method of claim 19, further comprising transmitting the control signals in a voice-frequency band.

21. (previously presented) The method of claim 19, further comprising:

receiving and transmitting DSL signals via an ATU-C coupled to the local loop; and

controlling access to the local loop via a DSLAM controller coupled to the processor and the ATU-C.

22. (Original) The method of claim 21, wherein the processor receives local loop information from the DSLAM controller.

23. (Original) The method of claim 21, wherein the processor sends instructions to the DSLAM controller for operating the ATU-C.

24. (previously presented) The method of claim 19, further comprising:

improving transmission of POTS band signals over the local loop via a POTS loading coil coupled to the local loop;

providing communications, control, and diagnostic functionality via a diagnostic/ control unit coupled to the local loop; and

providing DSL signal amplification via the amplification circuitry capacitively coupled to the local loop via bypass switches.

25. (previously presented) The method of claim 24, wherein providing communications, control, and diagnostic functionality further comprises:

receiving the control signals from the central office controller;

processing the received control signals;

sampling DSL signal data in accordance with the processed control signals; and

processing the sampled DSL signal data.

26. (previously presented) The method of claim 25, wherein processing the sampled DSL signal data comprises computing average power.

27. (previously presented) The method of claim 25, wherein processing the sampled DSL signal data comprises computing peak power.

28. (previously presented) The method of claim 25, wherein processing the sampled DSL signal data comprises computing root-mean-square power.

29. (previously presented) The method of claim 25, wherein processing the sampled DSL signal data comprises computing power spectral density.

30. (previously presented) The method of claim 25, further comprising uncoupling the amplification circuitry from the local loop in accordance with the processed control signals.

31. (previously presented) The method of claim 25, further comprising coupling the amplification circuitry to the local loop in accordance with the processed control signals.

32. (previously presented) A system for improving transmission of DSL signals over a local loop, the system comprising:

a central office controller, the central office controller including,

a first modem coupled to the local loop,

a processor coupled to the first modem,

loop extender management software executable by the processor for generating control signals,

an ATU-C coupled to the local loop configured to receive and transmit DSL signals, and

a DSLAM controller coupled to the processor and the ATU-C configured to control access to the local loop; and

a loop extender coupled to the central office controller via the local loop, the loop extender including,

a POTS loading coil adapted to be coupled to the local loop for improving transmission of POTS band signals over the local loop,

amplification circuitry capacitively coupled to the local loop via bypass switches for providing DSL signal amplification,

a second modem coupled to the local loop for receiving the control signals,

an AMADC coupled to the amplification circuitry for sampling DSL signal data within the amplification circuitry via diagnostic lines, and

a DCP coupled to the second modem and the AMADC for processing the control signals received via the second modem and analyzing the sampled DSL signal data from the AMADC to evaluate the amplification circuitry.

33. (previously presented) The system of claim 32, wherein the first modem and second modem are coupled to the local loop to communicate in a voice-frequency band.

34. (previously presented) The system of claim 32, wherein the central office controller is coupled to the local loop to transmit the control signals to the loop extender via the local loop when POTS signals are not present on the local loop.

35. (previously presented) The system of claim 32, wherein the DCP is coupled to the AMADC to process the sampled DSL signal data to compute average power.

36. (previously presented) The system of claim 32, wherein the DCP is coupled to the AMADC to process the sampled DSL signal data to compute peak power.

37. (previously presented) The system of claim 32, wherein the DCP is coupled to the AMADC to process the sampled DSL signal data to compute root-mean-square power.

38. (previously presented) The system of claim 32, wherein the DCP is coupled to the AMADC to process the sampled DSL signal data to compute power spectral density.

39. (Original) The system of claim 32, further comprising a bypass relay for coupling the DCP to the bypass switches.

40. (previously presented) The system of claim 39, wherein the DCP, in response to control signals from the central office controller, is configured to activate the bypass relay to uncouple the amplification circuitry from the local loop.

41. (previously presented) The system of claim 39, wherein the DCP, in response to control signals from the central office controller, is configured to deactivate the bypass relay to couple the amplification circuitry to the local loop.

42. (currently amended) A method for improving transmission of DSL signals over a local loop, the method comprising:

generating control signals in a central office;

transmitting the control signals and DSL signals over the local loop;

providing DSL signal amplification via amplification circuitry coupled to the local loop;

sampling DSL signals within the amplification circuitry in accordance with the control signals received by a diagnostic/ control unit coupled to the amplification circuitry; ~~and~~

processing the sampled DSL signals to evaluate amplification circuitry performance; and

using the processed DSL signals to improve transmission of the DSL signals over the local loop.

43. (previously presented) The method of claim 42, wherein processing the sampled DSL signals comprises computing average power.

44. (previously presented) The method of claim 42, wherein processing the sampled DSL signals comprises computing peak power.

45. (previously presented) The method of claim 42, wherein processing the sampled DSL signals comprises computing root-mean-square-power.

46. (previously presented) The method of claim 42, wherein processing the sampled DSL signals comprises computing power spectral density.

47. (previously presented) The method of claim 42, further comprising uncoupling the amplification circuitry from the local loop in accordance with control signals received by the diagnostic/control unit.

48. (previously presented) The method of claim 42, further comprising coupling the amplification circuitry to the local loop in accordance with control signals received by the diagnostic/control unit.

49. (previously presented) A system for improving transmission of DSL signals, the system comprising:

means for generating control signals;

means for transmitting the control signals and DSL signals;

means for amplifying the DSL signals;

means for processing the control signals;

means for sampling the DSL signals within the means for amplifying in accordance with the processed control signals; and

means for processing the sampled DSL signals to evaluate the means for amplifying.